

DEPARTMENT OF COMMERCE

BUREAU OF STANDARDS

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UNITED STATES GOVERNMENT MASTER SPECIFICATION FOR
SODA, CAUSTIC (LYE) (FOR CLEANING PURPOSES)

FEDERAL SPECIFICATIONS BOARD SPECIFICATION No. 430

This specification was officially promulgated by the Federal Specifications Board on September 25, 1926, for the use of the departments and independent establishments of the Government in the purchase of caustic soda (lye) (for cleaning purposes).

[The latest date on which the technical requirements of this specification shall become mandatory for all departments and independent establishments of the Government is December 27, 1926. They may be put into effect, however, at any earlier date after promulgation]

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I. GENERAL SPECIFICATIONS

There are no general specifications applicable to this specification.

II. GRADE

Caustic soda shall be furnished in one grade only.

III. MATERIAL

See Detail requirements.

IV. GENERAL REQUIREMENTS

Caustic soda shall be furnished in flake, coarsely powdered, or granular form, as specified by the purchaser.

V. DETAIL REQUIREMENTS

Caustic soda shall contain not less than 90 per cent sodium hydroxide (NaOH) and not more than 4 per cent carbonate, calculated as sodium carbonate (Na_2CO_3).

VI. METHODS OF INSPECTION, TESTING, AND BASIS OF PURCHASE

1. SAMPLING

One can of caustic soda shall be taken at random from each lot of 50 or less and sent to the laboratory for test.

2. TESTING

(a) **PREPARATION OF SAMPLE.**—Make a record of the label on the can, weigh, then open can, quickly transfer its contents to a clean, dry salt-mouth bottle, and tightly stopper. Clean, dry, and weigh the can and subtract its weight from the first weight to obtain the net weight. Note the condition of the sample. If more than one can of caustic soda constitutes the sample, obtain the net weight for each, transfer the contents of all of the cans to one bottle, and mix.

(b) **PRELIMINARY PROCEDURE.**—Quickly transfer about 20 g of the sample from the bottle to a tared, glass-stoppered weighing bottle, stopper, and weigh. Transfer the weighed sample as rapidly as possible to a 1-liter graduated flask, using freshly boiled and cooled distilled water. Rinse the weighing bottle thoroughly with freshly boiled and cooled distilled water, adding the rinsings to the flask. Add sufficient freshly boiled and cooled distilled water to about half fill the flask, stopper, whirl slightly to dissolve the sample, and cool to room temperature. Dilute to the mark with freshly boiled and cooled distilled water and mix thoroughly.

(c) **HYDROXIDE.**—Pipette 50 cc of the original solution into a 300 cc Erlenmeyer flask, add 50 cc of a 10 per cent solution of BaCl_2 and five drops of phenolphthalein indicator and titrate with 0.5 *N* H_2SO_4 until the pink color just vanishes. From the burette reading calculate the percentage of hydroxide as NaOH (1 cc of 0.5 *N* acid = 0.02 g NaOH).

(d) CARBONATE.—To the solution used in the hydroxide determination add three drops of methyl orange solution and titrate the barium carbonate with 0.5 *N* H_2SO_4 . From the number of cubic centimeters of acid required in this titration calculate the percentage of carbonate as Na_2CO_3 (1 cc of 0.5 *N* acid=0.0265 g Na_2CO_3).

(e) TOTAL ALKALINITY.—From the total number of cubic centimeters of acid required in the hydroxide and carbonate titrations, calculate the percentage of total alkalinity as Na_2O (1 cc of 0.5 *N* acid=0.0155 g Na_2O).

3. REAGENTS

(a) STANDARD SODIUM HYDROXIDE SOLUTION.—0.5 *N*, or about 20 g of pure sodium hydroxide dissolved in water and diluted to 1 liter. Standardize against Bureau of Standards standard benzoic acid, using phenolphthalein indicator.

(b) STANDARD SULPHURIC ACID SOLUTION.—0.5 *N*, or about 25.8 g strong sulphuric acid (specific gravity=1.84) diluted to 1 liter. Standardize against standard sodium hydroxide solution (a), using methyl orange indicator.

(c) BARIUM CHLORIDE SOLUTION.—Dissolve 100 g of barium chloride ($\text{BaCl}_2 \cdot 2\text{H}_2\text{O}$) in distilled water and dilute to 1 liter.

(d) PHENOLPHTHALEIN INDICATOR.—Dissolve 1 g of pure phenolphthalein in 100 cc of 85 to 95 per cent ethyl alcohol.

(e) METHYL ORANGE INDICATOR.—Dissolve 1 g of methyl orange in 1 liter of distilled water.

4. BASIS OF PURCHASE

Caustic soda shall be purchased by net weight.

VII. PACKING AND MARKING

Caustic soda shall be furnished in air-tight metal cans. Each can shall be marked with the name of the material, the net weight of its contents, the trade-mark, if any, and the name of the manufacturer.

VIII. NOTES

Caustic soda conforming to this specification is the grade of caustic soda commonly used for general cleaning purposes.

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